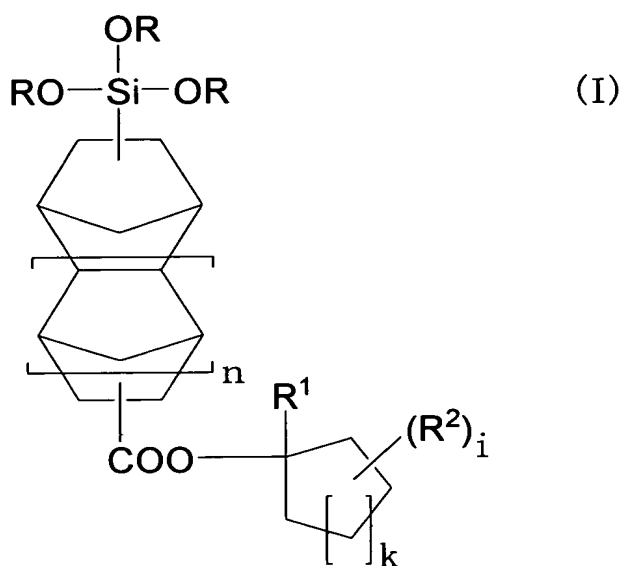


## CLAIMS

1. A silane compound shown by the following formula (I),



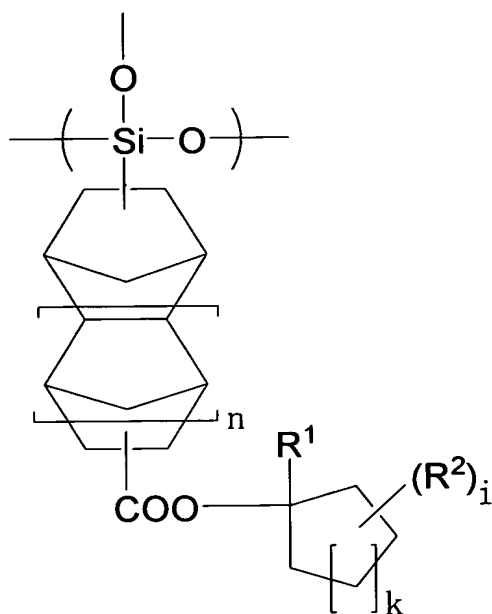
wherein R individually represents a linear, branched, or cyclic alkyl group having 1 to 20 carbon atoms,  $R^1$  and  $R^2$  individually represents a fluorine atom, a linear or branched alkyl group having 1 to 4 carbon atoms, or a linear or branched fluoroalkyl group having 1 to 4 carbon atoms, n is 0 or 1, k is 1 or 2, and i is an integer of 0 to 8 when k = 1 and an integer of 0 to 10 when k = 2.

2. The silane compound according to claim 1, wherein R in the formula (I) individually represents a methyl group or ethyl group.

3. The silane compound according to claim 1, wherein  $R^1$  represents a methyl group or ethyl group and i is 0 in the formula (I).

4. The silane compound according to claim 1, wherein n is 0 in the formula (I).

5. A polysiloxane having a structural unit shown by the following formula (1) and having a polystyrene-reduced weight average molecular weight determined by gel permeation chromatography (GPC) in a range of 500 to 1,000,000,

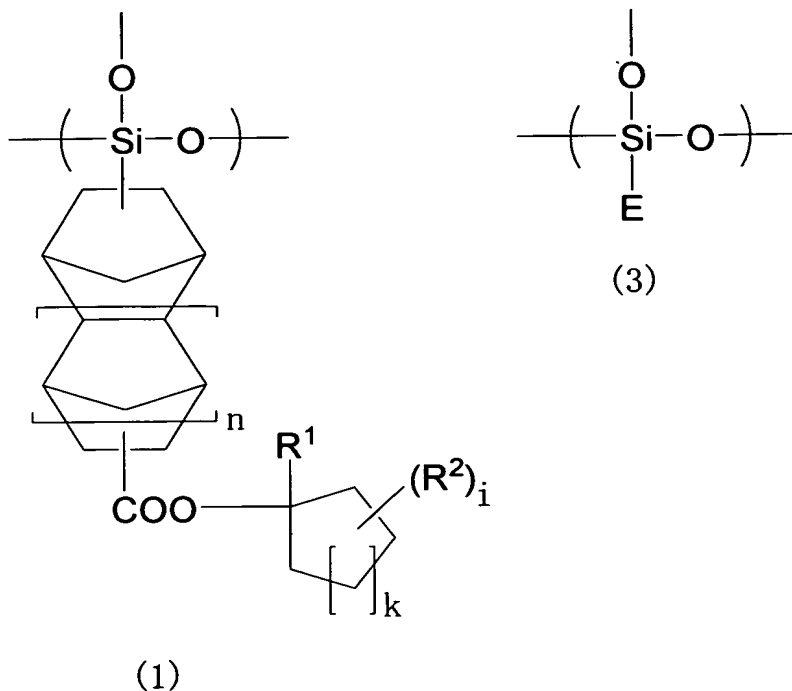


(1)

wherein  $\text{R}^1$  and  $\text{R}^2$  individually represents a fluorine atom, a linear or branched alkyl group having 1 to 4 carbon atoms, or a linear or branched fluoroalkyl group having 1 to 4 carbon atoms,  $n$  is 0 or 1,  $k$  is 1 or 2, and  $i$  is an integer of 0 to 8 when  $k = 1$  and an integer of 0 to 10 when  $k = 2$ .

6. A polysiloxane having a structural unit shown by the following formula (1) and a structural unit shown by the following formula (3), and having a polystyrene-reduced weight average molecular weight determined by gel permeation

chromatography (GPC) in a range of 500 to 1,000,000,

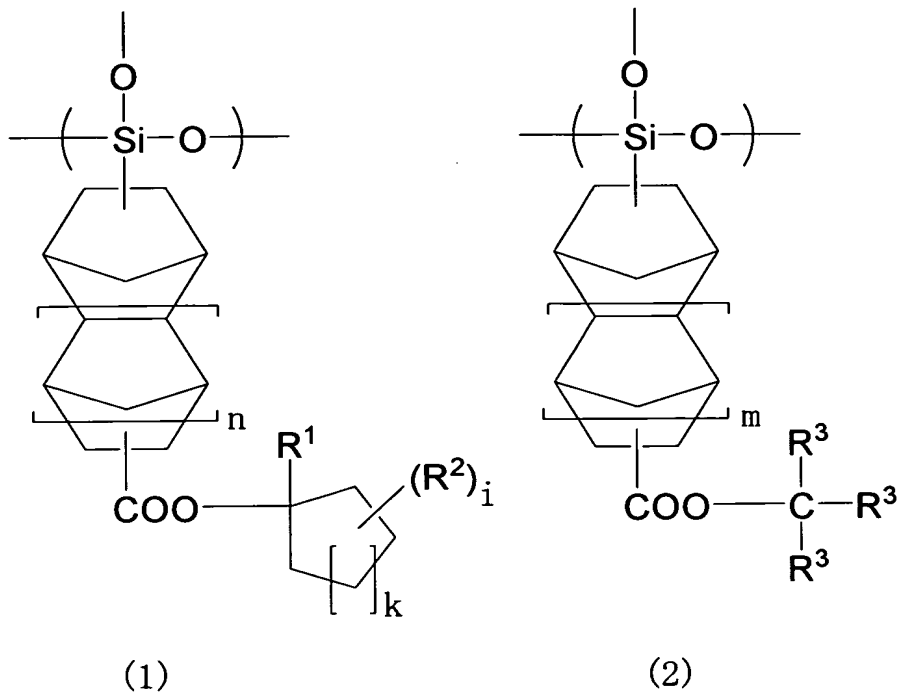


- 5 wherein in the formula (1),  $R^1$  and  $R^2$  individually represents a fluorine atom, a linear or branched alkyl group having 1 to 4 carbon atoms, or a linear or branched fluoroalkyl group having 1 to 4 carbon atoms,  $n$  is 0 or 1,  $k$  is 1 or 2, and  $i$  is an integer of 0 to 8 when  $k = 1$  and an integer of 0 to 10 when  $k = 2$ , and in the formula (3),  $E$  is a monovalent organic group having a fluorohydrocarbon group.

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7. A polysiloxane having a structural unit shown by the following formula (1) and a structural unit shown by the following formula (2) (excluding the structural unit shown by the following formula (1)), and having a polystyrene-reduced weight average molecular weight determined by gel permeation chromatography (GPC) in a range of

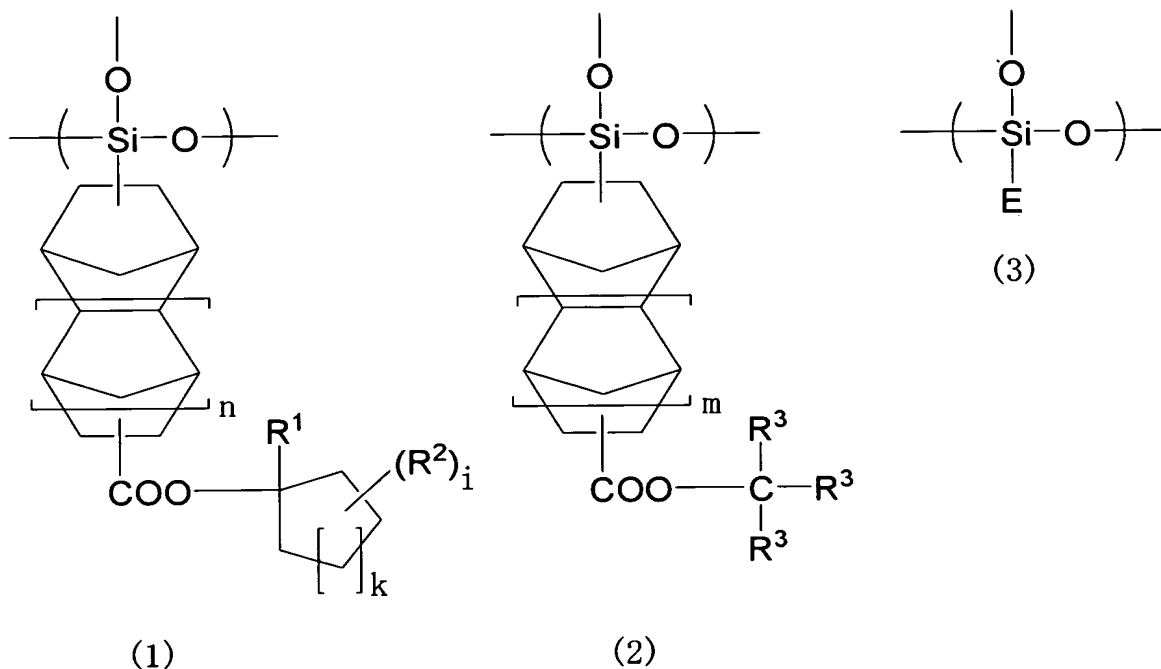
15 500 to 1,000,000,



wherein in the formula (1),  $\text{R}^1$  and  $\text{R}^2$  individually represents a fluorine atom, a linear or branched alkyl group having 1 to 4 carbon atoms, or a linear or branched fluoroalkyl group having 1 to 4 carbon atoms,  $n$  is 0 or 1,  $k$  is 1 or 2, and  $i$  is an integer of 0 to 8 when  $k = 1$  and an integer of 0 to 10 when  $k = 2$ , and in the formula (2),  $\text{R}^3$  individually represents a linear or branched alkyl group having 1 to 4 carbon atoms or a monovalent alicyclic hydrocarbon group having 4 to 20 carbon atoms or a derivative thereof, or any two of  $\text{R}^3$ s form in combination a divalent alicyclic hydrocarbon group having 4 to 20 carbon atoms or a derivative thereof, with the remaining  $\text{R}^3$  being a linear or branched alkyl group having 1 to 4 carbon atoms or a monovalent alicyclic hydrocarbon group having 4 to 20 carbon atoms or a derivative thereof, and  $m$  is 0 or 1.

8. The polysiloxane according to claim 7, wherein  $\text{R}^3$  in the formula (2) individually represents a linear or branched alkyl group having 1 to 4 carbon atoms.

9. A polysiloxane having a structural unit shown by the following formula (1), a structural unit shown by the following formula (2) (excluding the structural unit shown by the following formula (1)), and a structural unit shown by the following formula (3), and having a polystyrene-reduced weight average molecular weight determined by gel permeation chromatography (GPC) in a range of 500 to 1,000,000,



wherein in the formula (1),  $R^1$  and  $R^2$  individually represents a fluorine atom, a linear or branched alkyl group having 1 to 4 carbon atoms, or a linear or branched fluoroalkyl group having 1 to 4 carbon atoms,  $n$  is 0 or 1,  $k$  is 1 or 2, and  $i$  is an integer of 0 to 8 when  $k = 1$  and an integer of 0 to 10 when  $k = 2$ , in the formula (2),  $R^3$  individually represents a linear or branched alkyl group having 1 to 4 carbon atoms or a monovalent alicyclic hydrocarbon group having 4 to 20 carbon atoms or a derivative thereof, or any two of  $R^3$ s form in combination a divalent alicyclic hydrocarbon group having 4 to 20 carbon atoms or a derivative thereof, with the remaining  $R^3$  being a linear or branched alkyl group having 1 to 4 carbon atoms or a monovalent alicyclic hydrocarbon group

having 4 to 20 carbon atoms or a derivative thereof, and m is 0 or 1, and in the formula (3), E is a monovalent organic group having a fluorohydrocarbon group.

10. A radiation-sensitive resin composition comprising (A) the polysiloxane  
5 according to claim 5 and (B) a photoacid generator.

11. A radiation-sensitive resin composition comprising (A) the polysiloxane  
according to claim 6 and (B) a photoacid generator.

10 12. A radiation-sensitive resin composition comprising (A) the polysiloxane  
according to claim 7 and (B) a photoacid generator.

13. A radiation-sensitive resin composition comprising (A) the polysiloxane  
according to claim 8 and (B) a photoacid generator.

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14. A radiation-sensitive resin composition comprising (A) the polysiloxane  
according to claim 9 and (B) a photoacid generator.

15. The radiation-sensitive resin composition according to claim 10, wherein (B)  
20 the photoacid generator is a compound generating a sulfonic acid by exposure to  
radiation.

16. The radiation-sensitive resin composition according to claim 11, wherein (B)  
the photoacid generator is a compound generating a sulfonic acid by exposure to  
25 radiation.

17. The radiation-sensitive resin composition according to claim 12, wherein (B)

the photoacid generator is a compound generating a sulfonic acid by exposure to radiation.

18. The radiation-sensitive resin composition according to claim 13, wherein (B)  
5 the photoacid generator is a compound generating a sulfonic acid by exposure to radiation.

19. The radiation-sensitive resin composition according to claim 14, wherein (B)  
the photoacid generator is a compound generating a sulfonic acid by exposure to  
10 radiation.